

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460**

**OFFICE OF THE ADMINISTRATOR
EPA SCIENCE ADVISORY BOARD**

May 29, 2003

MEMORANDUM

SUBJECT: US EPA Science Advisory Board (SAB) Staff Office's Selection of Experts to Augment the Expertise of the Advisory Council on Clean Air Compliance Analysis to form a Special Council Panel for the Review of the Third 812 Analysis, the Air Quality Modeling Subcommittee, and the Health Effects Subcommittee

FROM: Angela Nugent */Signed/*
Designated Federal Officer
Office of the EPA Science Advisory Board (1400A)

TO: Vanessa T. Vu PhD
Director
Office of the EPA Science Advisory Board (1400A)

This memo addresses the set of determinations that are necessary for starting a review by the SAB. It provides background information on this SAB review activity and then addresses:

- 1) the charge developed to be addressed by the Council and its two subcommittees, the Air Quality Modeling Subcommittee (AQMS) and the Health Effects Subcommittee (HES) and the expertise required to address the charge;
- 2) identification of parties who are potentially interested in or may be affected by the topic to be reviewed;
- 3) whether the charge involves a Particular Matter and how conflict of interest regulations under 18 U.S.C. 208. to experts to be added to the Council, AQMS, and HES;
- 4) how regulations concerning "appearance of lack of impartiality" under 5 C.F.R. 2635.502 apply to experts to be added to the Council, HES, and AQMS;
- 5) how experts were identified through the "Widecast" process and selected for the "Short List" of experts to add to the Council, HES, and AQMS
- 6) how individuals were selected to add to the Council, HES, and AQMS.

This memo serves to document the status of decisions on each of these topics and to document the SAB Staff Office Director's approval of those decisions.

A. Background

In December 2002, the US EPA Office of Air and Radiation provided a specific request for the Advisory Council on Clean Air Compliance Analysis (Council) to provide advice regarding the development of the Third 812 Analysis of the Costs and Benefits of the Clean Air Act (also called the Second Prospective Analysis). The Council is a separately chartered federal advisory committee that provides scientific advice on any analysis required under section 312 of the Clean Air Act (CAA) of the impacts of the Clean Air Act (CAA) on the public health, economy, and environment of the United States. Members of the Council are also members of the science Advisory Board and are appointed by the Administrator. The Council has historically had two subcommittees that aid it in providing advice to the Administrator: the Council's Air Quality Modeling Subcommittee (AQMS); and (c) the Council's Health and Ecological Effects Subcommittee (HEES). The AQMS of the Council provides expertise on air quality modeling used in such analysis. The HEES of the Council has provided advice on assessments of health and ecological effects used in such analyses. The Chairs of the AQMS and the HEES are members of the Council and the SAB. The AQMS and the HEES report to the Administrator of EPA through the Council.

The SAB Staff used the SAB process for panel formation, as described in the document *Overview of the Panel Formation Process at the Environmental Protection Agency Science Advisory Board*, in identifying candidate experts and selecting them to augment the Council for review of the 3rd 812 Study and in selecting the membership of the AQMS and Health Effects Subcommittees.

B. Determinations

1. The charge developed to be addressed by the Council and its two subcommittees, the Air Quality Modeling Subcommittee (AQMS) and the Health Effects Subcommittee (HES) and the expertise required to address the charge. Following receipt of the Agency's detailed request in December 2002, the Council, the Agency provided a detailed list in January 2003 of "analytical elements for which new or updated SAB Council advice is expected to be sought" and for which detailed charge questions were to be addressed. In reviewing these questions and the Agency's request, in consultation with the Council Chair and the Chairs of the Council's subcommittees, as well as the Agency, the SAB Staff Office identified specific expertise needed to supplement the Council itself and to form the subcommittees to provide technical advice on air quality modeling health effect issues.

The SAB Staff Office published a Federal Register Notice Requesting Nominations for this Expertise (68 FR 7531_7534, February 14, 2003) requesting nominations in the following areas:

- (a) Emissions estimation (AQMS and the Special Council Panel)
- (b) Air quality modeling (AQMS and the Special Council Panel)
- (c) Exposure modeling related to air pollution (AQMS, HEES)
- (d) Health effects (HEES and the Special Council Panel))
- (e) Human clinical studies related to air pollution (HEES)
- (f) Air pollution epidemiology (HEES and the Special Council Panel)
- (g) Ecosystem effects related to air pollution (HEES and the Special Council Panel)
- (h) Uncertainty analysis and statistical and/or subjective probability (AQMS, HEES, and the Special Council Panel)
- (i) Decision theory (Special Council Panel)
- (j) Representation of expert judgment including expert elicitation (HEES and the Special Council Panel)
- (k) Estimation of the value of morbidity and premature mortality risk reduction (Special Council Panel)
- (l) Estimation of the value of ecosystem effects (Special Council Panel)
- (m) Welfare economics (Special Council Panel).

It should be noted that subsequent to the publication of the FEDERAL REGISTER notice, the SAB Staff Office made progress on a related SAB initiative, a major self initiated project on "Valuing the Protection of Ecological Systems and Services" and is in the very last stages of panel formation for that Committee. Given the establishment of that new Committee, the SAB Staff office has chosen to focus the previously named "Health and Ecological Effects Subcommittee" on health effects and to rename it as the "Health Effects Subcommittee." As the workplan of the new committee on "Valuing the Protection of Ecological Systems and Services" develops and may include some advice on ecological benefits associated with the 812 analysis, the SAB Staff will publish in the FEDERAL REGISTER a notice of those plans

2) Identification of parties who are potentially interested in or may be affected by the topic to be reviewed. The review topic encompasses all aspects of costs and benefits of implementing the Clean Air Act, so all Americans are potentially interested in the review activity. Stakeholders affected by current and planned EPA rulemakings may have the most immediate interests because the analytic efforts of the Agency involved in this broad study may have implications for those activities.

3) Whether the charge involves a Particular Matter¹ and how conflict of interest regulations under 18 U.S.C. 208. to experts to be added to the Council, AQMS, and HES.

This topic is not a particular matter, because it involves a broad range of technical issues that underpin the Agency's entire analysis of costs and benefits of implementing all aspects of Clean Air Act. That analysis may assist the Agency in considering or adopting broad policy options directed to the interests of a large and diverse group of people. The analysis does not involve regulations, policies or standards that affect a particular industry or other class of people or entities. Since the activity is not a particular matter, there is no legal conflict of interest presented under 18 U.S.C. 208..

4. How regulations concerning "appearance of lack of impartiality" under 5 C.F.R. 2635.502 apply to experts to be added to the Council, HES, and AQMS;. The Code of Federal Regulations state that "Where an employee knows that a particular matter involving specific parties is likely to have a direct and predictable effect on the financial interest of a member of his household, or knows that a person with whom he has a covered relationship is or represents a party to such matter, and where the person determines that the circumstances would cause a reasonable person with knowledge of the relevant facts to question his impartiality in the matter, the employee should not participate in the matter unless he has informed the agency designee of the appearance problem and received authorization from the agency designee."

This advisory activity is not a particular matter that is specific party matter, so there is no legal issue concerning "appearance of lack of impartiality" under federal regulations. Furthermore, review of the selected experts' financial disclosure forms indicate no potential appearance issues with the advisory topic.

5. How experts were identified through the "Widecast" process and selected for the "Short List" of experts to add to the Council, HES, and AQMS. Following the process outlined in the *Overview of the Panel Formation Process at the Environmental Protection Agency Science Advisory Board*, the February 14, 2003 FEDERAL REGISTER notice requested nominations for experts to augment the Council, the AQMS and what is currently termed the HES. Ten experts were identified for the Council by four different nominators; nineteen experts were identified for the AQMS by seven different sources, eleven experts were identified for the HES by six different nominators.

The widecast submissions by and for those experts were reviewed with the Chairs of the Council, AQMS and HES for relevance to the expertise needed. Factors considered included the individual's scientific and/or technical expertise, knowledge, and experience, as related to the analytical elements named by the Agency and likely charge questions; demonstrated scientific

¹The term "particular matter" refers to matters that involve deliberation, decision, or action that is focused on the interests of specific people or a discrete and identifiable class of people. The term may include matters that do not involve formal parties and may extend to legislation or policy-making that is narrowly focused on the interests of a discrete and identifiable class of people. But the term does not cover consideration or adoption of broad policy options directed to the interests of a large and diverse group of people. [5 C.F.R. 2640.103(a)(1)]

credibility and impartiality; and demonstrated ability to work constructively and effectively in committees. The DFO also considered the individual expert's availability and willingness to serve.

From this review, "Short Lists" of candidates were identified to augment the Council, the AQMS and what is currently termed the HES. The "Short Lists" along with biosketches for each expert, were posted on the SAB website, along with an "Invitation for Comments on 'Short List' Candidates for the Advisory Council on Clean Air Compliance Analysis and its Subcommittees on May 5, 2003. Four experts were identified for the Council; thirteen "Short List" candidates were posted for the AQMS, eight experts were identified for the HES.

6. How individuals were selected for the final panel. The SAB received four comments in response to its request for "information, analysis, or documentation" that the Board should consider in making its selection of members of the panel. (Attachment 3 lists the names of individuals who provided public comment). The DFO considered this information along with: (a) the Confidential Financial Disclosure Forms completed by Short List Candidates; (b) certificates of Ethics Training completed by candidates; (c) responses from Short List candidates to queries about their "points of view" and relationship to the review material to be considered by the panel (Attachment 4); (d) Curriculum Vitae provided by candidates and supplementary materials provided by them; and (e) results of an independent investigation of the points of view of Short List panel members.

The DFO developed a proposed final list for discussion with the Chairs of the Council, AQMS and HES. The proposal was designed to provide the expertise, knowledge, and experience in needed areas; breadth of viewpoints representing different points of view; and for the AQMS and HES, a balance between new panel members and members with prior experience on the Subcommittees. The resulting roster is attached for the expanded Council that includes the new experts that augment the Council for the 3rd 812 Analysis in the areas of representation of expert judgment including expert elicitation, uncertainty analysis and statistical and subjective probability. Rosters are also attached listing the experts chosen to address air quality modeling and human health effects for the AQMS and the HES, respectively.

Concurred,

/Signed/
Vanessa Vu
Director
EPA Science Advisory Board Staff Office

May 29, 2003
Date

- Attachment 1: *Federal Register* Science Advisory Board Advisory Council on Clean Air Compliance Analysis Request for Nominations for Additional Expertise for the Special Council Panel for the Review of the Third 812 Analysis and the Council's Two Subcommittees, the Air Quality Modeling Subcommittee and the Health and Ecological Effects Subcommittee (68 FR 7531_7534, February 14, 2003)
- Attachment 2: Invitation for Comments on "Short List" Candidates for the Advisory Council on Clean Air Compliance Analysis and its Subcommittees May 5, 2003
- Attachment 3: List of the Names of Individuals who provided comment on individuals on the Short List
- Attachment 4: Questions posted to Short List candidates about their "points of view" and relationship to the review material to be considered by the panel
- Attachment 5: Roster of individuals for the Advisory Council on Clean Air Compliance Analysis and its Subcommittees

Attachment 1

[Federal Register: February 14, 2003 (Volume 68, Number 31)]

[Notices]

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ENVIRONMENTAL PROTECTION AGENCY

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Science Advisory Board

Advisory Council on Clean Air Compliance Analysis

Request for Nominations for Additional Expertise for the Special Council Panel for the Review of the Third 812 Analysis and the

Council's Two Subcommittees, the Air Quality Modeling Subcommittee and the Health and Ecological Effects Subcommittee

1. Action: Notice; request for nominations to add additional expertise to the Advisory Council on Clean Air Compliance Analysis (Council) for a Special Council Panel for the Review of the Third 812 Analysis and request for nominations for membership on the Council's two subcommittees, the Air Quality Modeling Subcommittee and the Health and Ecological Effects Subcommittee (HEES). The Council is a separately chartered federal advisory committee, housed administratively in the U.S. Environmental Protection Agency Science Advisory Board.

2. Summary: The U.S. Environmental Protection Agency (EPA or Agency) Science Advisory Board is requesting nominations to: a) add expertise to the Advisory Council on Clean Air Compliance Analysis (Council) for a Special Council Panel for the Review of the Third 812 Analysis (Special Council Panel); b) the Council's Air Quality Modeling Subcommittee (AQMS); and c) the Council's Health and Ecological Effects Subcommittee (HEES).

The SAB was established to provide independent scientific and technical advice, consultation, and recommendations to the EPA Administrator on the technical basis for Agency positions and regulations. The Council provides scientific advice on any analysis required under section 312 of the Clean Air Act (CAA) of the impacts of the Clean Air Act (CAA) on the public health, economy, and environment of the United States and is a separately chartered Federal advisory committee Federal Advisory Committee Act (FACA), as amended (5 U.S.C. App.). The AQMS of the Council provides expertise on air quality modeling used in such analysis. The HEES of the Council provides advice on assessments of health and ecological effects used in such analyses. The AQMS and the HEES will report to the Administrator of EPA through the Council. The Special Council Panel will comprise members of the Council, appointed by the Administrator, and additional experts needed for the Review of the Third 812 Analysis. Members of the Special Council Panel, AQMS, and HEES will provide advice to the Agency on the Third 812 Analysis over a two-year period. Over that period, the Special Council Panel for the Review of the Third 812 Analysis, AQMS, and HEES will comply with the provisions of FACA and all appropriate SAB procedural policies, including the SAB process for panel formation described in the Overview of the Panel Formation Process at the Environmental Protection Agency Science Advisory Board, which can found on the SAB's website at:

<http://www.epa.gov/sab/pdf/ec02010.pdf>. Those selected to serve on the Council, AQMS, and HEES will review the draft materials identified in this notice and respond to the charge questions provided below.

3. Background: The Agency is seeking the Council's advice in developing the third in a series of statutorily mandated comprehensive analyses of the total costs and total benefits of programs implemented pursuant to the Clean Air Act. Section 812 of the Clean Air Act requires the EPA to periodically assess the effects of the 1990 Clean Air Act Amendments on the "public health, economy and the environment of the United States" and to report the findings and results of the assessments to Congress. Section 812 of the Clean Air Act Amendments of 1990 (42 U.S.C. §7612) also specifically directed the EPA Administrator to establish the Council to: a) review data to be used for any analysis required under section 312 of the Clean Air Act (CAA) of the impacts of the Clean Air Act (CAA) on the public health, economy, and environment of the United States. and make recommendations on its use; b) review the methodology used to analyze such data and make recommendations on the use of such methodology; and c) prior to the issuance of a report to Congress required under section 312 of the CAA, review the findings of the report and make recommendations concerning the validity and utility of such findings.

EPA has to date completed two reports to Congress [The Benefits and Costs of the Clean Air Act: 1970 to 1990 (published, 1997, and on the EPA website at <http://www.epa.gov/oar/sect812/copy.html>) and The Benefits and Costs of the Clean Air Act, 1990 to 2010 (published 1999), and on the EPA website at http://www.epa.gov/air/sect812/1990_2010/fullrept.pdf] and received the advice of the Council on them in multiple reports. EPA also sought Council advice on a draft Analytical Plan (June 2001) for a third analysis, and received advice on the plan from the Council in September 2001, Review of the Draft Analytical Plan for EPA's Second Prospective Analysis _ Benefits and Costs of the Clean Air Act 1990_2020 (EPA_SAB_COUNCIL_ADV_01_004, on the SAB website at <http://www.epa.gov/science1/pdf/councila01004.pdf>).

EPA's work pursuant to the draft Analytical Plan (June 2001) and receipt of SAB Council advice was suspended pending resolution of three key issues:

a) National Academy of Sciences (NAS) review of EPA air pollution benefits methods. Shortly after completion of the September 2001 SAB Council review of the June 2001 Analytical Plan, a panel of the National Academy of Sciences initiated development of their statutorily-mandated report evaluating EPA's methods for conducting air pollution reduction benefits analysis. The Agency recognized that the pending NAS report would have substantial effects on the selection of methods and assumptions in the third analysis, and suspended initiation of analytical work until the NAS review was completed. The NAS report, Estimating the Public Health Benefits of Proposed Air Pollution Regulations (on the web at <http://www.nap.edu/catalog/10511.html>), was completed in October 2002.

The Agency notes that the NAS report recommends numerous changes to EPA methods that are relevant for the third 812 analysis. Of particular importance, the NAS recommends that EPA develop and apply significantly enhanced uncertainty analysis methods, including the use

of probabilistic specifications for important but uncertain or highly variable factors. The NAS panel, however, did not provide extensive specific advice regarding the appropriate methods or assumptions to apply in air pollution benefits analyses. The Agency proposes to seek Council advice to evaluate proposals for methodological changes pursuant to SAB and NAS advice. One specific change will be an additional analysis recommended by the NAS. This analysis, referred to as the "Fixed Current Conditions Analysis," is intended to gauge baseline aggregate uncertainty embedded in the benefits modeling system.

b) Base emissions inventory selection. The Agency decided to wait for the availability of the upcoming 1999 National Emissions Inventory (NEI) rather than the currently available 1996 National Emissions Inventory because of shortcomings in the current emission inventories, including several deficiencies identified by the SAB Council. The 1999 NEI has now been further delayed, and is not expected to be available for use in the third analysis until Summer 2003.

The Agency therefore proposes to use the time between now and Summer 2003, when the 1999 NEI will be available, to configure and begin implementing key supplemental analyses included in the original Analytical plan. These supplemental analyses include: i) a Title VI re_analysis; ii) a Hazardous Air Pollutant Case Study; and iii) an Ecological Service Flow Case Study. Specific proposals for design and implementation of these supplemental analyses would be incorporated in the revised Analytical Plan and submitted for review by the SAB Council.

c) Air quality model selection. The SAB Council strongly encouraged use of a comprehensive and integrated modeling system, such as the Community Multiscale Air Quality (CMAQ) model currently under development. The Agency also decided to defer initiation of emissions inventory development until air quality model evaluations for the key competing models [especially CMAQ versus the Regulatory Modeling System for Aerosols and Deposition (REMSAD) for modeling of particulate matter and CMAQ versus the Comprehensive Air Quality Model with Extensions (CAMx) for ozone modeling] were completed to ensure appropriate specification of the emission inventories used as inputs to the air quality models that will be selected for the study.

The Agency is seeking review by the Council Special Panel and its two subcommittees of three documents in the Spring 2003 that will assist the Agency in developing the third 812 analysis, which will be reviewed by the Council Special Panel and its two subcommittees in draft and final form in Fiscal Year 2004. The three documents to be reviewed in the Spring of 2003 include: a) a revised Analytical Plan; b) a new EPA meta-analysis for the Value of a Statistical Life (VSL), which has been developed in response, in part, to SAB Council advice for an updated and refined VSL estimate for use in third analysis; and c) a draft strategic plan for development and implementation of probabilistic uncertainty methods to be applied more generally in EPA benefit-cost analyses. This strategic plan is expected to include proposed processes for (i) probability-based uncertainty analysis and (ii) expert elicitation to configure probability distributions for key uncertain and/or variable factors where data are limited and/or function specification would likely be controversial.

4. EPA Request for and Proposed Charge to the Council, HEES, and AQMS. Specific and detailed charge questions are still under development, particularly since EPA is still developing methodological options for implementation of NAS advice, especially related to probabilistic uncertainty analysis. However, the particular analytical elements for which new or updated SAB Council advice is expected to be sought include the following:

- a) Selection of upcoming 1999 National Emissions Inventory
- b) Selection of REMSAD version 7.3 for PM and CAMx for ozone air quality modeling
- c) Selection of specific Computable General Equilibrium model for estimation of general equilibrium effects (proposed model choice still pending)
- d) Selection of exposure modeling methodology
- e) Methods for quantification of compliance cost uncertainty
- f) Methods for quantification of emission inventory uncertainty
- g) Refinements to population characteristics for health effect estimation, including:
 - i) updated baseline incidence and prevalence rates for morbidity and mortality
 - ii) adjustments to account for differences in study and applied populations
 - iii) accounting for population exposure variability
 - iv) population subgroup differentiation in estimating incidence changes
 - v) development of regional-scale population projections based on Woods and Poole Economics, Incorporated, 2001 projections
- h) Updated and expanded morbidity endpoint treatments, including:
 - i) revised asthma severity baseline using new National Health Interview Survey data
 - ii) expansion of asthma age range
 - iii) emergency room visits in children age 0 to 18
 - iv) non-fatal heart attacks in adults over 30
 - v) hospital admissions for all cardiovascular causes
 - vi) hospital admissions for all respiratory causes in children under age 2
 - vii) revisions to hospital admissions studies used to estimate changes in pneumonia, chronic obstructive pulmonary disease, and total cardiovascular
 - viii) asthma hospital admissions in children age 6 to 13
 - ix) ozone-related school loss days
 - x) additional calculations to extrapolate study population age ranges for application to all child age range for various concentration-response functions
 - xi) possible expert elicitation regarding methods to transfer non-U.S. data on doctor visits and medication usage
 - xii) possible expert elicitation regarding revision to the current triangular distribution for the chronic bronchitis severity adjustment factor
- i) Updated treatments for particulate matter mortality, including:
 - i) a proposed probability-based structure for cessation lags
 - ii) alternative mortality concentration-response functions (including possible expert elicitation regarding appropriate weights for alternative particulate matter cohort studies for the purpose of pooling)
 - iii) alternative PM mortality threshold models (including possible expert elicitation regarding choice and refitting of alternative threshold concentration-response curves)
 - iv) alternative particulate matter causality assumptions

- v) relative toxicity of particulate matter components
- j) Updated and new valuation coefficients (or coefficient distributions) for the full range of morbidity and for mortality endpoints, including:
 - i) development of methods to estimate Quality Adjusted Life Year values for air pollution-related outcomes
 - ii) review of EPA's pending meta-analysis for Value of a Statistical Life
 - iii) review of the welfare economics components of EPA's analyses including not only efficiency considerations, but distributional consequences of alternative scenarios.
- k) Expanded uncertainty analysis, including:
 - i) development of preliminary covariance matrices followed by possible expert elicitation for assessment and refinement
 - ii) development of probability distributions for key uncertain and/or variable factors (in many cases, incorporating subjective judgments through various methods such as Bayesian approaches or expert elicitation.)
 - iii) configuration of sensitivity tests to evaluate alternative distributions for key factors
 - iv) configuration of the side bar "Fixed Current Conditions Analysis" represented in the EPA benefit-cost modeling system
 - v) configuration of multi-factor sensitivity tests to evaluate the relative significance and interaction effects of key uncertain or variable factors

5. SAB Request for Nominations: The EPA SAB is requesting nominations of individuals who are recognized, national-level experts in one or more of the following disciplines necessary to contribute to the charge questions to be addressed by the Special Council Panel for the Review of the Third 812 Analysis, AQMS, or HEES:

- a) Emissions estimation (AQMS)
- b) Air quality modeling (AQMS)
- c) Exposure modeling related to air pollution (AQMS, HEES)
- d) Health effects (HEES)
- e) Human clinical studies related to air pollution (HEES)
- f) Air pollution epidemiology (HEES)
- g) Ecosystem effects related to air pollution (HEES and the Special Council Panel)
- h) Uncertainty analysis and statistical and/or subjective probability (AQMS, HEES, and the Special Council Panel)
- i) Decision theory (Special Council Panel)
- j) Representation of expert judgment including expert elicitation (HEES and the Special Council Panel)
- k) Estimation of the value of morbidity and premature mortality risk reduction (Special Council Panel)
- l) Estimation of the value of ecosystem effects (Special Council Panel)
- l) Welfare economics (Special Council Panel).

6. Process and Deadline for Submitting Nominations: Any interested person or organization may nominate qualified individuals to add expertise in the above areas for the Special Council Panel for the Review of the Third 812 Analysis, AQMS, or HEES. Nominations should be submitted in electronic format through the Form for Nominating Individuals to Panels of the EPA Science Advisory Board provided on the SAB website. The form can be accessed through a link on the blue navigational bar on the SAB website, www.epa.gov/sab. To be considered, all nominations must include the information required on that form.

Anyone who is unable to submit nominations in electronic format may contact Dr. Angela Nugent at the mailing address given at the end of this notice. Nominations should be submitted in time to arrive no later than 21 days after the publication date of this Federal Register Notice. Any questions concerning either this process or any other aspects notice should be directed to Dr. Nugent.

The EPA Science Advisory Board will acknowledge receipt of the nomination and inform nominators of the panel selected. From the nominees identified by respondents to this Federal Register notice (termed the "Widecast"), SAB Staff will develop a smaller subset (known as the "Short List") for more detailed consideration. Criteria used by the SAB Staff in developing this Short List are given at the end of the following paragraph. The Short List will be posted on the SAB Web site at: <http://www.epa.gov/sab>, and will include, for each candidate, the nominee's name and their biosketch. Public comments will be accepted for 21 calendar days on the Short List. During this comment period, the public will be requested to provide information, analysis or other documentation on nominees that the SAB Staff should consider in evaluating candidates for the specific expertise to add to the Council for the Special Council Panel, for the AQMS, or the HEES.

For the EPA SAB, a balanced review panel (i.e., committee, subcommittee, or panel) is characterized by inclusion of candidates who possess the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the charge. Public responses to the Short List candidates will be considered in the selection of the panel, along with information provided by candidates and information gathered by EPA SAB Staff independently on the background of each candidate (e.g., financial disclosure information and computer searches to evaluate a nominee's prior involvement with the topic under review). Specific criteria to be used in evaluating an individual subcommittee member include: a) scientific and/or technical expertise, knowledge, and experience (primary factors); b) absence of financial conflicts of interest; c) scientific credibility and impartiality; d) availability and willingness to serve; and e) ability to work constructively and effectively in committees.

Short List candidates will also be required to fill-out the "Confidential Financial Disclosure Form for Special Government Employees Serving on Federal Advisory Committees at the U.S. Environmental Protection Agency" (EPA Form 3110_48). This confidential form, which is submitted by EPA SAB Members and Consultants, allows Government officials to determine whether there is a statutory conflict between that person's public responsibilities (which includes membership on an EPA Federal advisory committee) and private interests and

activities, or the appearance of a lack of impartiality, as defined by Federal regulation. The form may be viewed and downloaded from the following URL address:

http://www.epa.gov/sab/pdf/epaform3110_48.pdf. Subcommittee members will likely be asked to attend at least one public face-to-face meeting and several public conference call meetings over the anticipated course of the advisory activity.

The approved policy under which the EPA SAB selects review panels is described in a recent SAB document, EPA Science Advisory Board (SAB) Panel Formation Process:

Immediate Steps to Improve Policies and Procedures – An SAB Commentary (EPA_SAB_EC_COM_002_003), which can be found on the SAB's website at:

<http://www.epa.gov/sab/pdf/ecm02003.pdf>.

Additional information concerning the EPA Science Advisory Board, including its structure, function, and composition, may be found on the EPA SAB Web site at:

<http://www.epa.gov/sab>; and in the EPA Science Advisory Board FY2001 Annual Staff Report, which is available from the EPA SAB Publications Staff at phone: (202) 564_4533; via fax at: (202) 501_0256; or on the SAB Web site at: <http://www.epa.gov/sab/annreport01.pdf>.

7. For Further Information - Any member of the public wishing further information regarding this Request for Nomination may contact Dr. Angela Nugent, Designated Federal Officer, U.S. EPA Science Advisory Board (1400A), Suite 6450C by telephone/voice mail at (202) 564-4562, by fax at (202) 501-0323; or via e-mail at nugent.angela@epa.gov.

Date

Vanessa T. Vu, Ph.D.
Director,
EPA Science Advisory Board Staff Office.

Attachment 2

Invitation for Comments on "Short List" Candidates for the Advisory Council on Clean Air Compliance Analysis and its Subcommittees May 5, 2003

The EPA Science Advisory Board (SAB, Board) announced in the Federal Register of 68 FR 7531-7534, February 14, 2003, that it was requesting nominations for membership on the Council's Air Quality Modeling Subcommittee, Health and Ecological Effects Subcommittee, and experts in uncertainty analysis, statistical and/or subjective probability, and decision theory to supplement the Council. Background on the project and details on panel nomination process reviewed appear in the above referenced Federal Register notice and are also available at the SAB website, (www.epa.gov/sab).

In regard to the Air Quality Modeling Subcommittee, the SAB Staff Office has reviewed the 19 nominations for the Subcommittee, and has narrowed the list of nominees to a "Short List" of 13 candidates based on the qualifications and interest of the nominees. Brief biosketches of the 13 candidates on the current "Short List" are listed below for comment. In regard to the Health and Ecological Effects Subcommittee, the Science Advisory Board received 11 nominations for health effects experts. The SAB Staff Office has reviewed the nominations and narrowed the list of nominees to a short list of 8 individuals, whose biosketches also appear below. A "Health Effects Subcommittee" of the Council will be formed from individuals on this list. Because no experts in ecological effects were identified through the widecast process, the Staff Office has decided to request that the Council discuss forming a new subcommittee to focus on ecological effects or another mechanism to consider ecological effects, including coordination with a new SAB Committee on "Valuing the Protection of Ecological Systems and Services."

The SAB Staff Office We invites comments from the public on the short-list candidates identified below. We welcome information, analysis or documentation that the Board should consider in evaluating the "Short List" remaining candidates. This information will be carefully considered in selecting the subcommittee, which will be composed of 7-10 experts. Individuals should send their comments to Dr. Angela Nugent, Designated Federal Officer for the Panel, by May 15, via email to nugent.angela@epa.gov.

The SAB Staff Office Director, in consultation with SAB leadership, as appropriate, makes the final decision about who will serve on the subcommittee. SAB Staff will complete its review of information regarding conflict of interest, possible appearance of impartiality, and appropriate balance and breadth needed to address the charge. They review all the information provided by the candidates, along with any information that the public may provide in response to the posting of information about the prospective panel on the SAB website during the "Short List Phase," and information gathered by SAB Staff independently on the background of each candidate.

Air Quality Modeling Subcommittee

Person	Organization	BioSketch
Allen, David T.	University of Texas	Dr. David Allen is the Gertz Professor of Chemical Engineering and the Director of the Center for Energy and Environmental Resources at the University of Texas at Austin. His research interests lie in environmental reaction engineering, particularly issues related to air quality and pollution prevention. He is the author of four books and over 125 papers in these areas. The quality of his research has been recognized by the National Science Foundation (through the Presidential Young Investigator Award), the AT&T Foundation (through an Industrial Ecology Fellowship) and the American Institute of Chemical Engineers (through the Cecil Award for contributions to environmental engineering). Dr. Allen was a lead investigator in one of the largest and most successful air quality studies ever undertaken: the Texas Air Quality Study (www.utexas.edu/research/ceer/texaqs). His current research is focused on using the results from that study to provide a sound scientific basis for air quality management in Texas. In addition, Dr. Allen is actively involved in developing Green Engineering educational materials for the chemical engineering curriculum. His most recent effort is a textbook on design of chemical processes and products, jointly developed with the U.S. EPA. Dr. Allen received his B.S. degree in Chemical Engineering, with distinction, from Cornell University in 1979. His M.S. and Ph.D. degrees in Chemical Engineering were awarded by the California Institute of Technology in 1981 and 1983. He has held visiting faculty appointments at the California Institute of Technology, the University of California, Santa Barbara, and the Department of Energy.
Alvarez, Ramon	Environmental Defense	Ramón Alvarez, Ph.D. has been a scientist in the Texas office of Environmental Defense since 1994. At Environmental Defense, he has promoted the attainment of air quality standards in Texas cities, with an emphasis on reducing emissions from electric power plants, cars and trucks. He also worked with industries on the US-Mexico border to find cost-effective methods of reducing waste and pollution. Dr. Alvarez obtained a B.S. degree in chemistry from Duke University and a Ph.D. in physical chemistry from the University of California at Berkeley, where he carried out research on atmospheric and combustion processes. At UC Berkeley he was a National Science Foundation Predoctoral Fellow and a lecturer in Environmental Chemistry. Dr. Alvarez is an expert on the technical and policy aspects of the State Implementation Plans for ozone in Dallas/Fort Worth and Houston/Glaveston. He currently serves on the Pollution Prevention Advisory Committee of the Texas Commission on Environmental Quality, and various technical advisory committees on air quality issues in Texas. He has also served on the Editorial Board of Environmental Engineering Science, the Board of Directors of the Texas Center for Policy Studies, and the Environmental Board of the City of Austin.
Chock, David	Ford Motor Company	Dr. David P. Chock received his B.A. degree with highest Honors in Chemistry from the University of California at Santa Barbara, and his Ph.D. degree in Chemical Physics from the University of Chicago. He was a Postdoctoral Fellow at the State University of New York at Buffalo, the Free University of Brussels, and the University of Texas at Austin, conducting research in electron-phonon interactions in semiconductors, dynamics of critical phenomena and hydrodynamic stability, respectively. He joined the General Motors Research Laboratories, and subsequently, Ford Research Laboratory, where he is the Leader of the Environmental Modeling Group in the Physical and Environmental Sciences Department. He has conducted a wide range of research related to the environment and its impact. This includes pollutant dispersion near roadways, improvement of numerical methods in air quality modeling by introducing accurate and fast algorithms to solve the advection equations and the stiff differential equations, extreme-value statistics of serially correlated data, time-series analysis, ozone trend analysis, statistical characteristics of the National Ambient Air Quality Standards, use of the random walk approach to study the impact of grid resolution and subgrid assumptions on air quality model predictions of a convective system containing fast nonhomogeneous atmospheric chemistry, and ozone impact of emissions from vehicles using alternative fuels, assessment of the benefit of an ozone-scavenging system for ambient ozone reduction. He has also conducted epidemiological studies, including the effect of confounding on results of incomplete models, the association of daily mortality and pollutant concentrations in Pittsburgh, and the impact of measurement errors on the detection of a health response threshold. More recently, he has been working on modification of the Comprehensive Air Quality Model (CAMx), application of a global chemistry transport model, and issues related to global climate change. He has published about 90 papers in refereed journals. He has also served on many EPA peer review panels, External Advisory Committees on Community Modeling and Analysis System (CMAS) and on an EPA STAR project. He was a Consultant on the AQMS panel of the Council.
Demerjian, Kenneth	State University of New York	Dr. Demerjian is Director of the Atmospheric Sciences Research Center (1986-present) and Professor in the Department of Earth and Atmospheric Sciences, University at Albany, State University of New York. He also holds an appointment in the Departments of Environmental Health and Toxicology in School of Public Health at SUNY and is a Visiting Scholar in the Division of Engineering and Applied Sciences at Harvard University. He holds a B.A. degree in Chemistry from Northeastern University and M.S. and Ph.D. degrees in Physical Chemistry from the Ohio State University. Prior to coming to Albany, he was director of National Oceanic and Atmospheric Administration, Meteorology Laboratory, which was assigned under an interagency agreement to the U.S. Environmental Protection Agency. Dr. Demerjian has served on and chaired professional committees and advisory panels including state and federal legislative advisory boards, National Academy of Science Committees, editorial boards and national and international research programs. He recently co-chaired the NARSTO Ozone Assessment and currently serves on the Research Committee of the Health Effects Institute (HEI) and on the Board on Oceans and Atmosphere of the National Association of State Universities and Land-Grant Colleges (BOA-NASULGC). He has published over seventy journal articles and book chapters in the area of atmospheric chemistry, air quality

		modeling and atmospheric process science. His research interests in the photochemistry and reaction mechanisms of polluted and clean atmospheres were initiated during his graduate education and he has maintained active research programs in these and related areas for over three decades.
Hansen, Alan	Electric Power Research Institute (EPRI)	<p>Since 1985, D. Alan Hansen has been the Manager of Tropospheric Studies for the Environmental Sector of the Electric Power Research Institute (EPRI). Dr. Hansen received his Ph.D. in Chemistry from the University of California, Irvine in 1973, and his B.A. in Chemistry from Southern Illinois University in 1967. Dr. Hansen's experience in modeling began in the Army as a member of a micrometeorological research group where he developed a model of the surface-atmosphere energy balance for various land covers. It continued at Southern Illinois University where he moonlighted by writing code for quantum mechanical simulations. It picked up again while an assistant research chemist at the Statewide Air Pollution Research Center of the University of California, Riverside, where he formulated the early code that, under the development of others, culminated in the SAPRC series of gas phase chemical mechanisms, while also studying hydroxyl radical kinetics and ozone-olefin chemiluminescence. After a hiatus from modeling of several years, while at ERT, he became a member of the team reviewing the development of the Acid Deposition and Oxidant Model (ADOM) under the sponsorship of the Canadian AES, the Ontario Ministry of the Environment (OME), the German Umweltbundesamt and EPRI. After joining EPRI, he managed EPRI's involvement with ADOM development which led to his participation in the formation of the Eulerian Model Evaluation and Field Study, a joint venture between, EPRI, AES, OME, EPA and the Florida Acid Deposition Monitoring Program, a major component of which was the comprehensive evaluation of RADM and ADOM. He chaired the EMEFS Working Group for its formative first two years. As an EPRI Project manager he also managed modeling development projects with the University of Washington (rain band modeling) and Colorado State University (LES). From the perspective Dr. Hansen gained in managing these diverse model development and evaluation studies, and the recognition that modeling assessments of multiple air quality issues would be facilitated and made mutually consistent through the integration of specialized models into a single framework and adoption of cutting edge computational techniques, he initiated a project in 1989 at EPRI with a concept paper describing a "comprehensive modeling system" (CMS). To implement this concept, he established the Consortium for Advanced Modeling of Regional Air Quality (CAMRAQ), which produced an in-depth CMS design report (<i>Design of a Framework for the Development of a Comprehensive Modeling System for Air Pollution</i>, EPRI TR-106852, September 1996). With the emergence of EPA's Models-3 program, Dr. Hansen disbanded CAMRAQ and advocated the policy at EPRI that new air quality modeling technology developed by EPRI would be incorporated into the Models-3 framework. Since then Dr. Hansen continues to be active in managing model development and evaluation activities at EPRI, including the development of methods for estimating modeling uncertainty. He has served or serves on many air quality modeling review and advisory committees, including those for the tri-national Commission for Environmental Cooperation, the Texas Natural Resources Conservation Commission (now the Commission for Environmental Quality), the SESARM seasonal modeling project, NARSTO, and the Community Modeling and Analysis System. He currently is the Coordinator for NARSTO's Model Comparison and Evaluation Study, investigating the relative and absolute performance of air quality models used for ozone management assessments by EPA, Meteorological Service of Canada, Coordinating Research Council, Southern Company and others.</p>
Jeffries, Harvey E.	University of North Carolina	<p>Dr. Harvey Jeffries has been a Professor of Atmospheric Chemistry in the Department of Environmental Sciences and Engineering at the University of North Carolina at Chapel Hill since 1971. He teaches graduate courses on atmospheric chemistry and photochemical modeling, including object-oriented design and programming. His research interests focus on gas phase atmospheric chemistry, specializing in volatile organic compound photooxidation with oxides of nitrogen to produce ozone, and the mathematical modeling of urban air chemistry, specifically, the development of numerical simulation models of photochemistry that become components of large scale Eulerian models incorporating meteorological and emissions sub models.. He has performed photochemical experimental and simulation research in smog chambers for 30 years and has been the lead investigator in the creation and implementation of a new photochemical reaction simulation methodology that uses morphemes (time varying, shape shifting molecules) to simulate the complex organic chemistry. Now, in collaboration with researchers from the UNC School of Medicine, he is conducting gas phase and particle experiments to test air quality effects on human lung cells. Dr. Jeffries has also been active in using these models to plan public policy for air pollution control. He is a scientific advisor to the NC state regulatory agency for the 8_ hour ozone nonattainment modeling for the NC SIP. He is a scientific advisor to the Business Coalition for Clean Air Appeal Group for the Houston Texas 1_ hour ozone nonattainment modeling. He is a member (since 1996) of the US EPA's Science Advisory Council, Air Quality Modeling Subcommittee, and a member of the California Air Resources Board Reactivity Scientific Advisory Board. He was a founding member (since 1998) of the Reactivity Research Working Group, a public/private research coordinating effort involving US EPA, academia, and industry. He is a member (since 1999) of the Research Advisory Committee for the Texas Air Research Center at Lamar University in Beaumont. He is a member (since 2002) of the Science Advisory Committee of the Texas Environmental Research Consortium operated by the Houston Advanced Research Center. He was a member (1995_1997) of the US EPA's FACA Subcommittee for the Implementation of New Standards for Ozone, PM, and Regional Haze; he received an Exceptional Leadership Award from the US EPA (1997) as Cochair of Science and Technical Workgroup for this FACA Subcommittee. In regard to funding for his research, he has a new EPA CoOperative agreement for \$1.5 Million for three years on Exposing Human</p>

		Lung Cells to Photochemical Reaction gas and particle products. The other source of support is a three year project funded by the American Chemistry Council (\$898,000), entitled "Innovative Experimental Techniques to Help Understand Exposure to Volatile Organic Air Toxics". "The overall goal of this project is to combine , develop and demonstrate new experimental techniques and methodologies that can be used to advance and prioritize the study of atmospheric chemical reactions of realistic mixtures including volatile organic air toxics and their transformation products, a significant subset of hazardous air pollutants (HAPS)."
Middleton,Paulette	Panorama Pathways	Dr. Paulette Middleton has almost 30 years experience leading programs that inform decisions and enhance understanding of the human-nature bond; building life-long, effective collaborations with organizations and individuals worldwide; and creating and using innovative communication strategies and assessment approaches. In 2002, she initiated Panorama Pathways, a consulting organization dedicated to creating steps to understanding and world peace. This past year she has developed several white papers and public information pieces on mercury in the west, impacts of pollution on visual air quality in the East, air quality impacts of oil and gas drilling operations in the West, benefits of reducing power plant emissions in Colorado, and nitrogen oxide issues in the western US. Middleton has been director of the Global Emissions Inventory Activity (GEIA) Center since GEIA's inception in 1990. For over a decade, she served and chaired a number of committees on the EPA Science Advisory Board. Middleton's professional background includes the University of Texas (PhD, Chemistry) the National Center for Atmospheric Research (staff scientist), the Atmospheric Sciences Research Center at the State University of New York at Albany (Research Faculty), Science & Policy Associates, Inc. (Vice President) and RAND (Director, RAND Environment). She has special expertise in integrated assessments, complex system modeling, strategic planning, multi-media communication, program/project management, business development, facilitation, and education with a focus on air quality and related environmental, energy, economic and social concerns.
Morris,Ralph	Environ Corp.	Mr. Ralph E. Morris is a Principal at ENVIRON International Corporation where he directs air quality modeling and analysis, control strategy development and evaluation, and regulatory air issues projects. He has over 20 years experience in air quality issues, with particular emphasis in the development and application of advanced air quality models and the development of air quality control plans. He has directed or was one of the key developers of many of the photochemical grid models that have been used to develop ozone attainment State Implementation Plans (SIPs) in the U.S. including the UAM, UAM-V, and CAMx. He has BA and MA degrees in mathematics from the University of California and has been an air quality consultant since 1979. At ENVIRON Mr. Morris' contract support comes from EPA and other federal agencies, state agencies, local agencies, trade organizations, and industry. Mr. Morris has been instrumental to bringing state-of-the-art air quality modeling techniques to regulatory air quality planning including demonstrating the use of photochemical grid models for ozone SIP modeling in the 1980's as leader of the EPA Five Cities UAM Study. Since then he has led the development of the next generation of nested-grid photochemical models (e.g., UAM-V and CAMx) and is currently leading the development of a state-of-the-science PMCAMx model that merges research-grade PM modules from academia (CMU and CalTech) with the CAMx platform. Mr. Morris has led or been involved in the development of ozone State Implementation Plans (SIPs) for numerous areas including: Los Angeles and San Francisco, CA; Houston/Galveston, Dallas-Fort Worth, and East Texas; Lake Michigan region; and St. Louis, MO. He has also led or been involved in the modeling of several PM SIPs, including: Los Angeles, Imperial County, and Owens Lake, CA; Rogue Valley OR; and Boise ID. ! Mr. Morris is currently assisting the Western Regional Air Partnership (WRAP) performing regional fine particulate and visibility modeling using the CMAQ and REMSAD models as part of the WRAP Regional Modeling Center (RMC). Mr. Morris was an original member of EPA's ozone guidance workgroup and is currently a member of EPA's fine particulate guidance workgroup. He is also currently a member of the CMAS Models-3/CMAQ External Advisory Committee (EAC) and is also a member of the Scientific, Technical, and Modeling Peer-Review Group (SMTPRAG) for the South Coast Air Quality Management District; (SCAQMD)
Price,James	Texas Natural Resource Conservation Commission	Dr. James Price is senior scientist in the Texas Commission on Environmental Quality's (TCEQ's) Technical Analysis Division. He holds bachelor's degrees in mathematics and chemistry, a master's in biochemistry, and a doctorate in environmental engineering, all from the University of Texas at Austin. For the past twelve years his work has been primarily in the design of field research studies and air quality monitoring networks and in the analysis of the data from them to elucidate the quantitative contributions of different emission sources to observed pollutant concentrations and to identify and explain discrepancies between the results of air quality modeling of estimated emissions and measurements of actual pollutant concentrations. He led TCEQ's participation in science planning for the Texas 2000 Air Quality Study of ozone, PM2.5, and regional haze in the eastern half of Texas. The Texas 2000 Air Quality Study involved over 250 researchers from over 35 organizations including the Southern Oxidants Study, NOAA, and DOE along with the TCEQ and Texas university researchers. He also led development, selection, and contracting of \$2.9 million in projects to accelerate the scientific analysis of data from the Texas 2000 Air Quality Study and resolve discrepancies between results from air quality modeling of estimated emissions and measured ambient concentrations. Except for brief work as a peer reviewer for the U.S. EPA, support of all of Dr. Price's work has come from the TCEQ, which is funded by the State of Texas with about a ten per cent contribution from the U.S. EPA. Dr. Price served on EPA's Clean Air Scientific Advisory Committee from 1994 to 1997 and on the Air Quality Modeling Subcommittee of EPA's Science Advisory Board from 1997 to 2002. He has been a member of the Air & Waste Management Association since 1977, serving as Chair of the Technical Program Steering Committee from 1991 to 1993 and as Technical Program Chairman for the association's 1988 Annual Meeting. Previously, Dr. Price initiated and led for over twelve years the development of Texas' environmental management program that assesses the health and welfare impacts of all air emissions from new and modified industrial sources of air emissions in the state. The assessments are based on predicted public exposure to ambient concentrations of air contaminants. Air quality dispersion modeling of estimated air emissions from the proposed facilities produces the estimates of future ambient concentrations to which the public may be exposed.

Rabideau,Chris	Shell Global Solutions	Mr. Chris Rabideau is a member of the Air Quality and Environmental Chemistry Consultancy in Shell Global Solutions. Educational Experience: B.S., Earth Science with Minor in Science and Environmental Change (1988) University of Wisconsin; Green Bay; M.S. Geography with emphasis in Meteorology (1990) Northern Illinois University. His experience in the air quality field covers, in particular, dispersion modeling, photochemical modeling, regulatory advocacy, atmospheric field studies, weather forecasting, and wastewater air emission estimation. Currently co-chair of the Texas Photochemical Grid Modeling Technical Oversight Committee. Active member of the Central States Regional Planning Association Modeling Workgroup; California Regional Air Quality Particulate Study and Central California Ozone Study technical committees; American Petroleum Institute Air Modeling Task Force and Clean Air Act Title I Task Force; Texas Air Research Center Advisory Board
Russell, Armistead	Georgia Institute of Technology	<p>Armistead G. Russell is the Georgia Power Distinguished Professor and Coordinator of Environmental Engineering at the Georgia Institute of Technology. Professor Russell arrived at Georgia Tech in 1996, from Carnegie Mellon University, and has expertise in air quality engineering, with particular emphasis in air quality modeling and analysis. He earned his M.S. and Ph.D. degrees in Mechanical Engineering at the California Institute of Technology in 1980 and 1985, conducting his research at Caltech's Environmental Quality Laboratory. His B.S. is from Washington State University (1979). Dr. Russell has been a member of a number of the National Research Council's committees, including chairing the Committee to Review EPA's Mobile Model and chairing the committee on Carbon Monoxide Episodes in Meteorological and Topographical Problem Areas, and serving on the committee on Tropospheric Ozone Formation and Measurement, the committee on ozone forming potential of reformulated fuels and the committee on Risk Assessment of Hazardous Air Pollutants. He was also a member of the EPA FACA Subcommittee on Ozone, Particulate Matter and Regional Haze, the North American Research Strategy for Tropospheric Ozone and California's Reactivity Science Advisory Committee. Previously he was on the Office of Science, Technology and Policy's Oxygenated Fuels Program Review and various National Research Council program reviews.</p> <p>Dr. Russell is a member of the Air and Waste Management Association, American Association for the Advancement of Science, American Society of Mechanical Engineering, Tau Beta Pi, Sigma Xi and the American Association for Aerosol Research. Dr. Russell has won a variety of competitions for animations he has developed that depict the dynamics of pollutants have won a variety of prizes here and abroad, and his work was selected as a finalist for the prestigious Smithsonian Award for Computing in the Environmental Sciences. Recently, Prof. Russell led a multi-institutional effort to conduct air quality modeling of ozone, particulate matter and acid deposition to assist the Southern Appalachians Mountains Initiative to identify effective control strategies to improve air quality in Class I areas in the southern Appalachians. This work has been extended to detailed analysis of air quality strategies in Georgia, particulate matter modeling in the Southeast and Northeast, and development of a number of advanced numerical techniques for environmental modeling. For his service to National Research Council committees, he was recently selected as a National Associate of the National Academies. His funding comes from a variety of sources, including the US EPA, DoD, various states and state organizations, and the chemical, automotive and utility industries.</p>
Walcek,Chris	SUNY	Dr. Chris Walcek is Senior Research Scientist. Atmospheric Sciences Research Center of the State University of NY Albany. Write proposals for research related to air pollution and the interactions with meteorology. Education background: PhD, MS, and in Atmospheric Sciences BS from UCLA, Physical meteorology/Cloud Physics emphasis. Area of expertise and research activities: Acid rain, ozone formation, heterogeneous chemistry, numerical methods air quality modeling, Mercury pollution, aircraft impacts. Service on advisory committees: Have served on 5-6 EPA Research Proposal and Fellowship review panels. Chaired the American Meteorological Society Atmospheric Chemistry committee 1996-2000 and organized two national meetings of that section. Recent Grant Support: Environmental Protection Agency, NY State Energy Research and Development Authority, Department of Energy, NASA.
Yarwood,Gregory	Environ International Corp.	Dr. Greg Yarwood is a Senior Consultant at ENVIRON Corporation. His main research interests and project activities are in atmospheric chemistry, photochemical modeling and the interpretation of ambient air quality data and photochemical model results. He was project manager and principle investigator for the development and implementation of ENVIRON's Ozone Source Apportionment Technology (OSAT) in both the Urban Airshed Model (UAM) and the Comprehensive Air Quality Model (CAMx). OSAT apportions model estimated ozone among emissions from selected source categories and geographical areas. Dr. Yarwood was co-Principal Investigator for a study to investigate the feasibility of using a 1996 field study in the Los Angeles basin to evaluate the ability of photochemical models to predict the change in air quality since the last major field study in 1987. He also managed a project that combined photochemical modeling and ambient data analyses for the North Slope of Alaska to estimate the potential impact of offshore drilling activities on tropospheric ozone levels near Prudhoe Bay. Dr. Yarwood performed extensive air quality (UAM) modeling of reformulated and alternative fuels for the joint Auto/Oil Air Quality Improvement Research Program (AQIRP). He was the technical lead for several AQIRP air quality modeling projects, such as fuel sulfur and light-olefin effects, sensitivity studies of the effects of uncertainties in biogenic and light-duty vehicle emissions, and sensitivity simulations using an alternative chemical mechanism (SAPRC) in the UAM. For each of these projects, Dr. Yarwood was responsible for overseeing the data analysis and emissions inventory development activities, and for integrating and explaining the data analysis, emissions, and air quality modeling issues and results. Dr Yarwood also managed a project for the EPA to review VOC receptor modeling and ambient measurement studies for evidence of biases in emission inventories.

"Health Effects Subcommittee"

Hurley,Fintan	Institute of Occupational Medicine (IOM)	Mr. Fintan Hurley is currently Research Director at the Institute of Occupational Medicine (IOM) – an independent non-profit organization carrying out research and consulting in occupational and environmental health, exposure and risk assessment – in Edinburgh, Scotland, UK. Dr. Hurley graduated 1st Honours B.A. in Mathematics, Statistics and Economics at the National University of Ireland (NUI) in Cork in 1970; MA (NUI) Mathematics and Statistics in 1971; post-graduate research in Bayesian methods at University of Edinburgh. His main research activities have been (i) epidemiological studies of the health effects of long-term occupational exposures to dusts, pesticides and (ii) since the early 1990s, on estimating the public health impacts and associated costs of outdoor air pollution, overall and from particular sources (electricity generation and transport...). His research experience has been multi-disciplinary, working closely with physicians, toxicologist, exposure specialists, ergonomists, economists, psychologists, mathematical modelers as well as other statisticians. Since 1996 he has been a member of the Committee on the Medical Effects of Air Pollutants (COMEAP) of the UK Department of Health and was from 1998-2002 a member of the Expert Panel on Air Quality Standards (EPAQS) of the UK Department of Environment (then, DEFRA). Sources of recent grant and/or contract support include the European Commission, the UK Health and Safety Executive, the UK Department of Health, DEFRA and various industries (e.g. London Underground).
Kinney,Patrick	Columbia University	Dr. Kinney is Associate Professor of Clinical Public Health in Environmental Health Sciences, Sc.D. Environmental Health Sciences/Air Pollution Control and Physiology at the Harvard University School of Public Health. His areas of research include Air pollution epidemiology, exposure assessment, exposure modeling, risk assessment. He is the Author of EPA ozone and PM criteria documents - epidemiologysections ; member of NAS panel on Health Benefits Analysis. Grant support: NIEHS, USEPA, National Urban Air Toxics Research Center.
Kleinman,Michael	University of California	Michael T. T. Kleinman is a Professor of Community and Environmental Medicine at the University of California, Irvine. He has a Ph.D. in Environmental Health Sciences from New York University and a M.S. in Chemistry (Biochemical Toxicology) from the Polytechnic Institute of Brooklyn. He also holds a B.S. in Chemistry from Brooklyn College, City University of New York. Dr. Kleinman has extensive experience in studies of the effects of airborne contaminants on health. His current research activities include inhalation studies with laboratory animals and human volunteers to test hypotheses related to defining causal relationships between health effects and components of ultrafine, fine and coarse pollutant particles. A key component in these studies, which include both laboratory based and epidemiological panel research programs, is the assessment of exposure and the relationship of exposure to dose. Dr. Kleinman also has had extensive experience in determinations of atmospheric transport of chemical contaminants. Dr. Kleinman has previously served as a consultant to the HEES. He currently is a member of the executive committee of the Southern California Particle Center and Supersite which is a multi-institutional consortium based at UCLA and which is supported by USEPA and the California Air Resources Board. He is currently the Chair of the Air Quality Advisory Committee for the state of California. This committee reviews the scientific basis of air quality regulations promulgated by the California EPA. Dr. Kleinman is a member of a National Academy of Sciences Committee to evaluate the preparation of the US Navy to operate in Chemical, Biological and Radiological Warfare situations. He was also the co-Chair of a National Academy of Sciences Committee to evaluate current capabilities related to Protection of Deployed Forces Against Chemical and Biological Weapons. He is the past chair of the Environmental Division of the Air and Waste Management Association and is a member of the executive committee of the University of California Toxic Substance Teaching and Research Program. Dr. Kleinman's current research support is from NIH, EPA, California Air Resources Board, and, in the past, he has had support from the Health Effects Institute, Electric Power Research Institute and Southern California Edison, among others.
Kunzli,Nino	University of Southern California	Dr. Nino Kunzli, MD PhD, former Assistant Professor (P.D.) at the Institute for Social and Preventive Medicine (ISPM) at the University of Basel (Switzerland), is Associate Professor at University of Southern California Keck School of Medicine (Department of Preventive Medicine; Environmental Health Science Division), Los Angeles. As an environmental epidemiologist, his main areas of focus are exposure to and health effects of ambient air pollution and the public health impact of these effects. He is a co-investigator and member of research teams such as the Swiss Study on Air Pollution and Lung Diseases in Adults (SAPALDIA; Swiss National Science Foundation), the European Community Respiratory Health Survey II (European Community Research Programs), where he leads the Air Pollution Central Unit, the European Population Exposure Distribution Assessment Study (EXPOLIS), and the UC Berkeley Ozone Study (Prof. Ira Tager; NIH grant). At USC he collaborates with the repeated cohort Children Health Study on air pollution and health in 12 South Coast Basin communities (NIH). He serves on national and international expert committees and as reviewers of the major journals in this field. With the Trinational European Air Pollution Impact Assessment project, published in Lancet, he intensified particularly a debate about the interpretation of air pollution epidemiology and its application to risk assessment. The concepts published in the American Journal of Epidemiology have been subject of several committees such as from WHO, leading to methodological guidelines and further work by many others. He was a member of the U.S. National Academy of Sciences NRC Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations which also addressed the issue of how to interpret effect estimates from different study designs.

Lioy,Paul J.	UMDNJ - Robert Wood Johnson Medical School	Dr. Paul J. Lioy, is a professor of Environmental and Community Medicine at UMDNJ-Robert Wood Johnson Medical School, Piscataway, N.J. He is Deputy Director for Governmental Relations at the Environmental and Occupational Health Sciences Institute (EOHSI) a joint program of Rutgers University and UMDNJ and also directs the Institute's program in Exposure Measurement and Assessment. Dr. Lioy was the 1998 Recipient of the International Society of Exposure Analysis Jerome Wesolowski Award for Lifetime Achievement in Exposure Analysis and in 2003 he is the recipient of the Frank Chambers Award in Air Pollution from the Air and Waste Management Association. He has been a member of the Science Advisory Board (SAB) of the US EPA (1991-2003), and was a member of its Advisory Council of Clean Air Compliance Analysis and Chair of the Health and Ecological Effects Committee. Currently, he is a consultant to the SAB on the CASAC. Dr. Lioy is a member of the US-Canada International Joint Commission Air Quality Advisory Board and a Fellow of the Collegium Ramazzini. He was the Program Chair for the 1997 and 2000 Annual Conference of the International Society for Exposure Analysis (ISEA). He is one of the founders of ISEA and was President from 1993-94. Dr. Lioy has been a member of the National Academy of Sciences Board of Toxicology and Environmental Studies, and was chair of their first committee devoted to Exposure Assessment and a member of various committees including Ozone, Particulate Matter, DOE Waste Sites, and Epidemiology. He has been an academic councilor to the New Jersey Legislature, and a member or chair of state councils and committees. He has been an executive editor or associate editor of a number of journals that deal with environmental science and/or air pollution, and has over 200 peer-reviewed publications. His research focuses on major Environmental Health problems, which include basic research on the measurement and modeling of exposure and dose derived for environmental agents that reach individuals, and those that can be derived from single or multiple routes of exposure.
Lippmann,Morton	New York University School of Medicine	Current professional affiliations and positions held by Dr. Lippman include: Professor, NYU School of Medicine, Area(s) of expertise, and research activities and interests: Human environmental exposure assessment and associated health effects, respiratory tract dosimetry, aerosol science and technology, risk assessment .Leadership positions in national associations or professional publications or other significant distinctions: Past Chair of: EPA SAB CASAC SAB Exposure Comm. NIOSH Board of Scientific Counsellors Amer. Conf. of Governmental Industrial Hygienists, Past President: International Society of Exposure Analysis, Educational background, especially advanced degrees, including when and from which institutions these were granted: B.Ch..E. (1954) - The Cooper Union S.M. (1955) - Harvard Univ.Ph.D. (1967) - New York Univ. Sources of recent (i.e., within the preceding two years) grant and/or other contract support, from government, industry, academia, etc., including the topic area of the funded activity: Center Grants: EPA - PM Health Effects Research NIEHS - Environmental Health Sciences EPA Cooperative Agreement: Personal Exposure to PM.
Ostro,Bart	California Office of Environmental Health Hazard Assessment (OEHHA)	Bart Ostro, Ph.D., is currently the Chief of the Air Pollution Epidemiology Unit, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. His primary responsibilities are to formulate the Agency's recommendations for state ambient air quality standards and to investigate the potential health effects of criteria air pollutants. His previous research on mortality and morbidity effects of air pollution, has contributed to the determination of federal and state air pollution standards for ozone and particulate matter. Dr. Ostro was also a co-author of the EPA regulatory impact analysis that was a basis for the federal ban of lead in gasoline. Dr. Ostro has served as a consultant with several federal and international institutions including the World Health Organization and the World Bank, and with several foreign governments including Mexico, Indonesia, Italy, the European Union, Thailand, and Chile. He currently serves on the National Academy of Sciences' Committee on Estimating the Health Risk Reduction Benefits of Proposed Air Pollution Regulations, and is on the Scientific Oversight Committee for ATHENA (Air Pollution Health Effects in Europe and North America) for the Health Effects Institute. Dr. Ostro received a Ph.D. in Economics from Brown University and a Certification in Environmental Epidemiology from the State of California. He has published over 60 articles on air pollution epidemiology and environmental economics in peer reviewed journals. His current research interests involve conducting epidemiologic studies on the mortality and morbidity effects of criteria air pollutants, examining the health effects of traffic, and quantifying the health benefits and associated uncertainties related to air pollution control.
Parkin, Rebecca	George Washington University	Dr. Rebecca T. Parkin is an Associate Research Professor in the Department of Environmental and Occupational Health with a joint appointment in the Department of Epidemiology and Biostatistics in the School of Public Health and Health Services at The George Washington University. She is also the Scientific Director of the Center for Risk Science and Public Health at the University. Previously Dr. Parkin was director of Scientific, Professional and Section Affairs at the American Public Health Association; the assistant commissioner of the Division of Occupational and Environmental Health at the New Jersey Department of Health; and an environmental epidemiologist at the Centers for Disease Control. Her areas of expertise include environmental epidemiology, public health policy, vaccine risk/benefit communication, and environmental health risk assessment and communication. She has been a member of the National Research Council's (NRC's) Water Science and Technology Board; and has served on numerous committees of the NRC, the Institute of Medicine, Environmental Protection Agency, Health and Human Services, and Agency for Toxic Substances and Disease Registry. Throughout her career, she has served as a site visitor for the Council on Education for Public Health, and as a peer reviewer for several professional journals focused on environmental health. Recently, she has coauthored a book on the CCL microbial pathogens and related risk assessment issues. Dr. Parkin received her A.B. in sociology from Cornell University; M.P.H. in environmental health and Ph.D. in epidemiology from Yale University; and Certificate in Science, Technology, and Policy from Princeton University. She has been honored by Yale University as a Distinguished Alumna for her extensive public service.

Additional Experts to Supplement the Council in Areas Needed for the Third 812 Analysis

Evans, John	Harvard University	Dr. Evans is Senior Lecturer in Environmental Science at Harvard School of Public Health, where he serves as co-director of the Program in Environmental Science and Risk Management. He holds a B.S.E. (Industrial Engineering) and a M.S. (Water Resources Management) from the University of Michigan and earned his S.M. and Sc.D. in Environmental Health Sciences at Harvard. Dr. Evans has worked in the field of risk analysis for over twenty years and has emphasized the importance of characterizing uncertainty in estimates of health risks in his research. He has experience in uncertainty analysis and has conducted several studies using formally elicited expert judgment to describe uncertainty in environmental health risks. His recent work has examined the role of decision and value of information analysis in setting priorities for environmental research. Dr. Evans has been a member of the Society for Risk Analysis since it was founded; has served as the Chair of the New England Chapter, and as both a member of the Editorial Board of the SRA's journal Risk Analysis and as an area editor of Risk Analysis. He was a member of the NAS Committee on Estimating the Health Benefits of Air Pollution Regulations and also served on the EPA Science Advisory Board (Drinking Water Committee). Dr. Evans' current research funding comes largely (over 90%) from the Government of Kuwait. In the past his work has been funded by a number of sources, including the US EPA Office for Research and Development, the Mexican Government (through subcontracts with MIT), several corporations and individuals (through contracts with and/or gifts to the Harvard Center for Risk Analysis), Health Canada, and the US Nuclear Regulatory Commission.
Hattis, Dale	Clark University	Dr. Dale Hattis is Research Professor with the Center for Technology Environment and Development (CENTED) of the George Perkins Marsh Institute at Clark University. For the past twenty-seven years he has been engaged in the development and application of methodology to assess the health ecological and economic impacts of regulatory actions. His work has focused on the development of methodology to incorporate interindividual variability data and quantitative mechanistic information into risk assessments for both cancer and non-cancer endpoints. Specific studies have included quantitative risk assessments for hearing disability in relation to noise exposure renal effects of cadmium reproductive effects of ethoxyethanol neurological effects of methyl mercury and acrylamide and chronic lung function impairment from coal dust four pharmacokinetic-based risk assessments for carcinogens (for perchloroethylene ethylene oxide butadiene and diesel particulates) an analysis of uncertainties in pharmacokinetic modeling for perchloroethylene and an analysis of differences among species in processes related to carcinogenesis. He has recently been appointed as a member of the Environmental Health Committee of the EPA Science Advisory Board and for several years he has served as a member of the Food Quality Protection Act Science Review Board. Currently he is also serving as a member of the National Research Council Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations. The primary source of his recent cooperative agreement support is the U.S. Environmental Protection Agency and specifically the Office of Research and Development's National Center for Environmental Assessment. This research includes: (1) Age related differences in susceptibility to carcinogenesis; towards a quantitative analysis of empirical data. Instrument number (Term: April 2002-Sept 2003); (2) Methods for evaluating human interindividual variability regarding susceptibility to particulates (Term Sept 98--September 2002); and (3) also funding from the State of Connecticut to work on Child/Adult differences in pharmacokinetic parameters, as a subcontractor as part of a cooperative agreement. He has been a councilor and is a Fellow of the Society for Risk Analysis and serves on the editorial board of its journal Risk Analysis. He holds a Ph.D. in Genetics from Stanford University and a B.A. in biochemistry from the University of California at Berkeley.
North, Warner	North Works Inc	Dr. D. Warner North is president and principal scientist of NorthWorks, Inc., a consulting firm in Belmont, California, and consulting professor in the Department of Management Science and Engineering at Stanford University. Over the past thirty years Dr. North has carried out applications of decision analysis, risk analysis, and cost-benefit analysis for electric utilities in the US and Mexico, for the petroleum and chemical industries, and for US government agencies with responsibility for energy and environmental protection. He has served as a member and consultant to the Science Advisory Board of the US Environmental Protection Agency since 1978, and as a Presidentially appointed member of the US Nuclear Waste Technical Review Board (1989-1994). Dr. North is a co-author of many reports dealing with environmental risk for the National Research Council of the National Academy of Sciences, including "Risk Assessment in the Federal Government: Managing the Process" (1983), "Improving Risk

		<p>Communication" (1989), "Science and Judgment in Risk Assessment" (1994), and "Understanding Risk: Informing Decisions in a Democratic Society" (1996). Dr. North was a member of the Board on Radioactive Waste Management of the National Research Council from 1995 until 1999. He was the chair for the steering and advisory committees for the International Workshop on the Disposition of High-Level Radioactive Waste, held November 4-5, 1999, and leading to the National Research Council report, "Disposition of High-Level Waste and Spent Nuclear Fuel: The Continuing Societal and Technical Challenges," published in June 2001. Dr. North is a past president (1991-92) of the international Society for Risk Analysis, a recipient of the Frank P. Ramsey Medal from the Decision Analysis Society in 1997 for lifetime contributions to the field of decision analysis, and the 1999 recipient of the Outstanding Risk Practitioner Award from the Society for Risk Analysis. Dr. North received his Ph.D. in operations research from Stanford University and his B.S. in physics from Yale University.</p>
Wallsten, Thomas	University of Maryland	<p>Dr. Thomas S. Wallsten is a professor in the Department of Psychology and in the Program in Cognitive Science and Neuroscience. He received his Ph.D. from the University of Pennsylvania in 1969, did a postdoctoral fellowship at the University of Michigan in 1970, and then joined the faculty at the University of North Carolina, Chapel Hill. He was professor of psychology and director of the Cognitive Science program when he left UNC-CH in 2000. Over the past years he was a visiting professor or visiting scholar at the University of Chicago, Duke University, Haifa University in Israel, and University of Oldenburg in Germany. He is a mathematical and cognitive psychologist with expertise in subjective probability, judgment, choice, decision behavior, and related areas of decision science and cognitive psychology. His current research focuses on subjective probability encoding and representation, communication of opinion, and human information processing under uncertainty. This research has been supported over the past 30 years primarily by grants from the National Science Foundation (NSF), with occasional additional support from other agencies. Current grants are from NSF and the Air Force Office of Scientific Research. Among his advisory roles, he was editor of the Journal of Mathematical Psychology from 1990-1994, associate editor of Psychometrika from 1984-1988, associate editor of the Journal of Experimental Psychology: Learning, Memory, and Cognition from 2000-2003, and on numerous editorial boards. He served in various advisory roles for NSF: During 1995-1997 on the grant review panel for Methodology, Measurement, and Statistics Program in the Division of Social, Behavioral, and Economic Research; in 2000 as a member of the Committee of Visitors for Social, Behavioral, and Economic Sciences Directorate; in 2003 as a member of the Committee of Visitors for the Behavioral and Cognitive Sciences Directorate; in 1998 on an ad hoc NSF_EPA grant review panel. In 2002, he was a grant review panel member for the Cognition and Student Learning Program of the Department of Education Office of Educational Research and Improvement.</p>

Attachment 3: List of the Names of Groups and Individuals Submitting Public Comment on the
Short Lists for the Council, AQMS, and HES

1. Mr. Chad Daniel, Senior Environmental Specialist, Iowa Department of Natural Resources
2. Mr. James Democker, US EPA
3. W.Dennis Isaacs, Past Chairman, Southeast Texas Regional Planning Commission, Air Quality Advisory Committee and Environmental Manager, E. I. DuPont de Nemours and Co., Inc.
4. Bob Dickinson, Director of Transportation and Environmental Resources, South East Texas Regional Planning Commission

Attachment 4: Questions Posted to Short List Candidates about Their "Points of View" and Relationship to the Review Material to Be Considered by the Panel

1. Have you had any previous involvement with the review document(s) under consideration, including authorship, collaboration with the authors, or previous peer review functions? If so, please identify that involvement.
2. Have you served on previous advisory panels or committees that have addressed the topic under consideration? If so, please identify those activities.
3. Have you made any public statements (written or oral) on the issue? If so, please identify those statements.
4. Have you made any public statements that would indicate to an observer that you have taken a position on the issue under consideration? If so, please identify those statements.

Attachment 5
Rosters

**U.S. Environmental Protection Agency
Science Advisory Board
Advisory Council on Clean Air Compliance Analysis
Special Council Panel for the Review of the Third 812 Analysis**

CHAIR

Dr. Trudy Cameron, Raymond F. Mikesell Professor of Environmental and Resource Economics, Department of Economics, University of Oregon, Eugene, OR
Also Member: Executive Committee

MEMBERS

Dr. David T. Allen, The Henry Beckman Professor in Chemical Engineering, Department of Chemical Engineering, University of Texas , Austin, TX

Ms. Lauraine Chestnut, Manager, Stratus Consulting Inc, Boulder , CO

Dr. Lawrence Goulder, Associate Professor, Department of Economics & Institute for International Studies, Stanford University, Stanford, CA
Also Member: Environmental Economics Advisory Committee

Dr. James Hammitt, Professor of Economics and Decision Sciences, Department of Health Policy and Management, School of Public Health, Harvard University, Boston, MA

Dr. F. Reed Johnson, Principal Economist and RTI Fellow, RTI Health Solutions, Research Triangle Institute, Research Triangle Park, NC

Dr. Charles Kolstad, Professor, Department of Economics, Bren School of Environmental Science and Management, University of California, Santa Barbara, CA

Dr. Lester B. Lave, Professor, Graduate School of Industrial Administration, Carnegie Mellon University, Pittsburgh, PA

Dr. Virginia McConnell, Senior Fellow; Professor of Economics, Resources for the Future, Washington, DC

Dr. Bart Ostro, Chief, Air Pollution Epidemiology Unit, California Office of Environmental Health Hazard Assessment (OEHHA), Oakland, CA

Dr. V. Kerry Smith, University Distinguished Professor, Department of Agricultural and Resource Economics, College of Agriculture and Life Sciences, North Carolina State University, Raleigh, NC

OTHER SAB MEMBERS

Dr. Dale Hattis, Research Professor, Center for Technology, Environment, and Development, Marsh Institute, Clark University, Worcester, MA

Member: Environmental Health Committee

CONSULTANTS

Dr. John Evans, Senior Lecturer on Environmental Science, Harvard University, Portsmouth, NH

Dr. D. Warner North, President, North Works Inc, Belmont, CA

Dr. Thomas S Wallsten, Professor, Department of Psychology , University of Maryland, College Park, MD

**U.S. Environmental Protection Agency
Science Advisory Board
Advisory Council on Clean Air Compliance Analysis
Air Quality Modeling Subcommittee***

CHAIR

Dr. David T. Allen, The Henry Beckman Professor in Chemical Engineering, Department of Chemical Engineering, University of Texas , Austin, TX

CONSULTANTS

Dr. David Chock, Leader, Environmental Modeling Group, Physical and Environmental Sciences Department, Research and Advanced Engineering, Ford Motor Company, Dearborn, MI

Dr. Dennis Alan Hansen, Manager, Tropospheric Studies, Environmental Sector, Electric Power Research Institute (EPRI), Palo Alto, CA

Dr. Harvey E. Jeffries, Professor, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, NC

Dr. Paulette Middleton, President, Panorama Pathways, Boulder, CO

Mr. Ralph Morris, Principal, Air Sciences Group, Environ Corp., Novato, CA

Dr. James Price, Senior Scientist, Technical Analysis Division, MC-164, Texas Natural Resource Conservation Commission, Austin, TX

Dr. Armistead Russell, Georgia Power Distinguished Professor of Environmental Engineering, Environmental Engineering Group, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

Dr. Armistead Russell, Georgia Power Distinguished Professor of Environmental Engineering, Environmental Engineering Group, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

Dr. Chris Walcek, Senior Research Scientist, Department of Atmospheric Sciences, Atmospheric Sciences Research Center, SUNY , Albany, NY

**U.S. Environmental Protection Agency
Science Advisory Board
Advisory Council on Clean Air Compliance Analysis
Health Effects Subcommittee**

CHAIR

Dr. Bart Ostro, Chief, Air Pollution Epidemiology Unit, California Office of Environmental Health Hazard Assessment (OEHHA), Oakland, CA

OTHER SAB MEMBERS

Dr. Rebecca Parkin, Associate Research Professor, Environmental and Occupational Health, Public Health and Health Services, The George Washington University, Washington, DC
Member: Integrated Human Exposure Committee
Executive Committee

CONSULTANTS

Mr. John Fintan Hurley, Research Director, Institute of Occupational Medicine (IOM), Edinburgh, , UK

Dr. Patrick Kinney, Associate Professor, Department of Environmental Health Sciences, Mailman School of Public Health , Columbia University, New York, NY

Dr. Michael Kleinman, Professor, Department of Community and Environmental Medicine, College of Medicine, University of California, Irvine, CA

Dr. Nino Kuenzli, Professor, Department of Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, CA

Dr. Morton Lippmann, Professor, Nelson Institute of Environmental Medicine, New York University School of Medicine, Tuxedo, NY